

The Mature Larva and Pupa of *Calobatina geometroides* (Cresson) (Diptera: Micropezidae)¹

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ABSTRACT

Larvae and puparia of *Calobatina geometroides* (Cresson) were collected in detritus in an old tree trunk at Warm Springs, Georgia. The mature larvae and puparium are described. Characters are given for separating *Calobatina* larvae from those of other known Micropezidae.

There are very few published descriptions of immature stages of micropezids in entomological literature. Hennig (1952) and Steyskal (1964) brought together information on the immature stages of this family. Steyskal included a key to the known third instar larvae of the Micropezidae. There are approximately 31 species of micropezids in 8 recognized genera north of Mexico in the Nearctic realm (Steyskal, 1965). However, there are only two or three descriptions of immature stages of the Nearctic fauna known and included in Steyskal's (1964) key.

Based on the known information of life histories, micropezid larvae appear to have saprophagous feeding habits. Sabrosky (1942) reared *Rainieria antennae* (Say) (as *R. brunneipes*) from puparia found in the crotch of an American elm. Berg (1947) reared *Mimegralla albimana* (Doleschall) from a variety of moist decaying plant material ranging from underneath the bark of trees to pulp surrounding palm seeds in the Solomon Islands. Steyskal (1964) reported additional rearings of *Mimegralla* spp. in ginger root from Asia. *Taeniaptera lasciva* (F.) has apparently been reared from underneath the bark of fig trees in Florida (Steyskal, 1964).

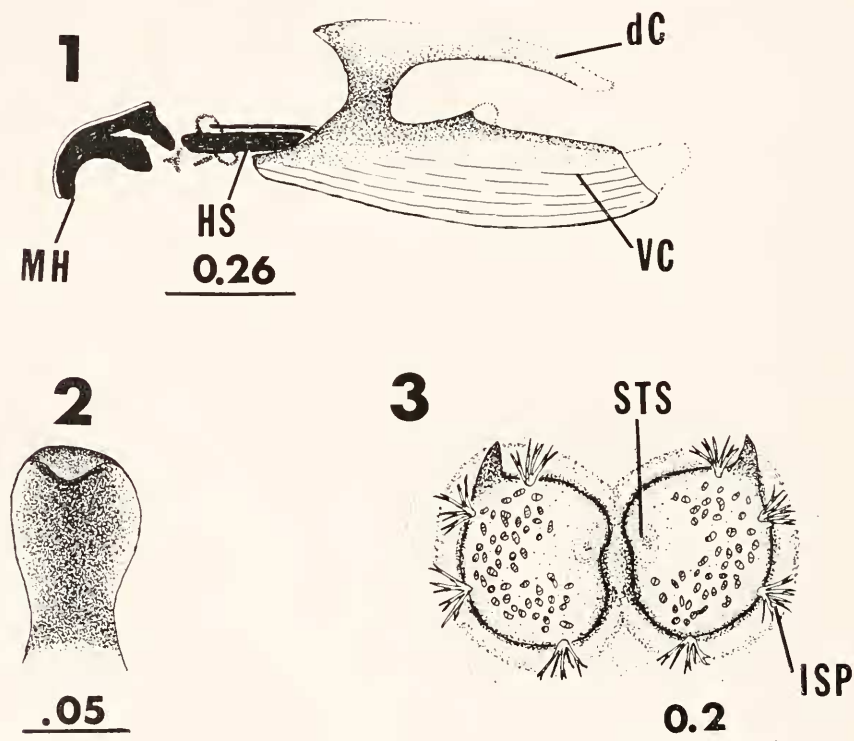
According to Steyskal (1964), there are three species in the genus *Calobatina* in the U. S. *Calobatina geometroides* is distributed from Missouri and Kentucky southward to Texas and Florida. Specimens included in this paper were collected from approximately 1 cubic foot of moist organic debris in a hollow stump of tulip poplar, *Liriodendron tulipifera*, within 100 yards of the famous spring at Warm Springs, Georgia. In addition to the micropezids, a number of Tabanidae larvae (Diptera), Collembola and isopods were feeding in the above media.

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On April 26, 1969, 8 larvae and 7 puparia were collected from the above habitat. All of the larvae were apparently in the late 3rd-instar when collected. Five of the 7 puparia had evidently been parasitized when found. The dorsal cephalic caps of the latter puparia were still intact and 3 of them had small holes in their midportion where the parasites had apparently emerged. No parasites were successfully reared from the remaining puparia. The puparia were formed in the same habitat as that in which the larvae were living. Some of the larvae and puparia were found as deep as 6 inches below the surface of the debris. The rather "spoon-shaped" mouthhooks (Fig. 2) and the larval habitat suggests saprophagous feeding habits of *C. geometroides*.

One adult emerged on May 30, 1969, from the puparia collected on April 26, 1969. These puparia had been held in the laboratory in 1×2



FIGS. 1-3. Third stage larva of *Calobatina geometroides*. 1, cephalopharyngeal skeleton (dc, dorsal cornua; HS, hypostomal sclerite; MH, mouthhook; vc, ventral cornua). 2, ventral view of apex of left mouthhook; 3, posterior spiracular plates (isp, interspiracular processes; sts, stigmatic scar). (All measurements in mm.)

in. plastic snap-top vials at 23–25° C from April 26. The 30-plus-day pupal period perhaps indicates that the life cycle of *C. geometroides* may be somewhat prolonged.

Calobatina geometroides (Cresson)

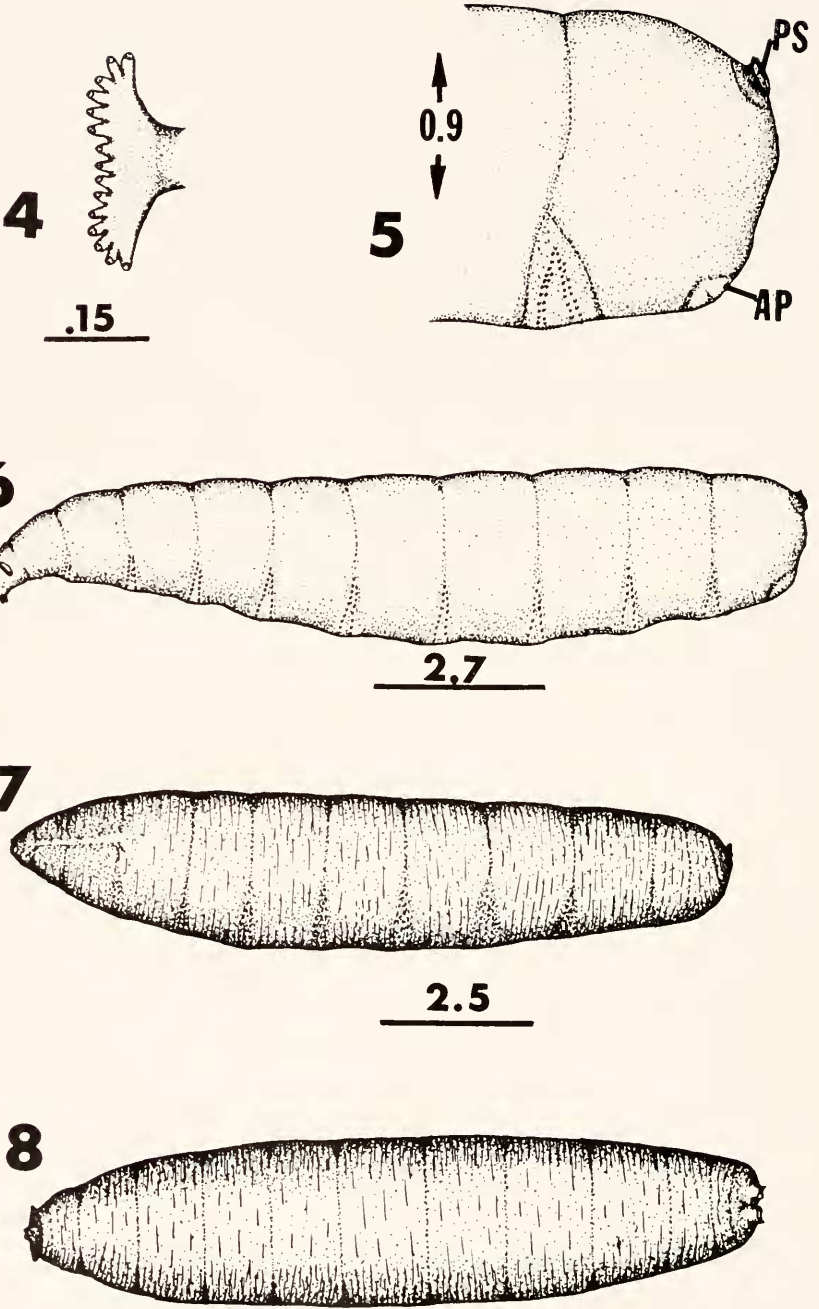
Third-instar Larva—cream white. Length 12.1–15.0 mm (\bar{X} = 13.5 mm), width 2.0–2.6 mm (\bar{X} = 2.25 mm). Maggot shaped with 12 apparent body segments (Fig. 6). Cephalopharyngeal skeleton; length = 1.15 mm (Fig. 1); with paired mouth-hooks, the apical portion of each hook somewhat "spoon-shaped" in ventral view (Fig. 2), each hook with two postero-ventral branches. A crescent-shaped dorsal bridge lies between the parastomal bars interiorly with a similar shaped bridge occurring ventrad to the hypostomal sclerite. Dorsal cornua of pharyngeal sclerite slightly shorter than ventral cornua which bears a dorsobasal lobe. Second thoracic segment bearing an anterior spiracle dorsolaterally on each side (Fig. 4), each spiracle with 14–16 (\bar{X} = 15) papillae. Creeping welts with small, rounded spicules present ventrally on intersegmental lines of segments II–IV through XI–XII. Posterior spiracular plates proximate as in Fig. 3; each on a rather heavily sclerotized stigmatophore; each spiracle with a heavily sclerotized dorsolateral spine. Spiracular openings numbering 40 or more, irregularly arranged on each spiracle without separation into definite slits; each spiracle with a distinct stigmatic scar (STS) and four branched interspiracular processes (ISP) located around the margin of each spiracle.

Anal plate about twice as wide as long, with a few very small, scattered, rounded, spinules around the anterior and lateral margin of the plate. (Based on 7 specimens, Warm Springs, Georgia).

Puparium—(Figs. 7–8)—Dark brown. Length—10.1–11.5 mm (\bar{X} = 11.1); width—2.0–2.5 mm (\bar{X} = 2.25 mm); tapering at the anterior end in dorsal and lateral view. Anterior spiracles (Fig. 4) at each antero-lateral margin with distinguishable papillae numbering 14–16 (\bar{X} = 15) around the margin of each spiracle. Remains of spinulose area of creeping welts visible ventrally at intersegmental lines. Posterior $\frac{1}{2}$ of puparium ringed with small striae; striae also present antero-ventrally. Posterior spiracular plates as two short, sclerotized projections at the posterior end of the puparium, distinctive shape, stigmatic scar, and spiracular openings still evident. Anastomosing remains of tracheal branches between individual spiracular openings and main tracheal trunk evident beneath the translucent spiracular surface. (Based on 5 specimens, Warm Springs, Georgia).

DISCUSSION

The larvae of *Calobatina geometroides* will correctly key to the subfamily Taeniapterinae in Steyskal's (1964) key to known micropezid larvae. However, a conflict will arise between his couplets 5 (*Rainieria antennaepe*s) and 6 (leading to *Mimegralla* spp. and *Taeniaptera* spp.). Based on Steyskal's descriptions of these latter 3 genera, *Calobatina* has the following attributes that will readily distinguish it from *Rainieria antennaepe*s: dorsal and ventral cornua approximately equal in length; posterior spiracle with irregularly arranged slits not in a winding configuration as in *Rainieria*



FIGS. 4-8.

antennae. *Calobatina* can be separated from *Mimegralla* and *Taeniaptera* on the basis of the latter two genera having posterior spiracles arranged in 3 definite slits, whereas those of *C. geometroides* are as in Fig. 3.

The larval anatomy of *C. geometroides* appears to support Steyskal's (1964) delineation of Micropezidae sens. str. larvae. The stigmatophore of the posterior spiracles, openings of the posterior spiracles, anal plate with only a few very weak spicules and the dorsobasal swelling of the ventral cornua agree well with characters used by him to separate the larvae of Micropezidae from the Neriidae.

ACKNOWLEDGMENT

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FIGS. 4-8. Third stage larva and puparium of *Calabatine geometroides*. 4, anterior spiracles of 3rd-stage larva; 5, lateral view of posterior spiracular disc of 3rd-stage larva (AP, anal plate; ps, posterior spiracles); 6, lateral view of 3rd-stage larva; 7, puparium lateral view; 8, puparium, dorsal view. (All measurements in mm.)